

*Vehicle Identity
with Coming
Automobile Lighting
Technologies*
未来车灯新技术的车辆识别



2019 DVN SHANGHAI INTERNATIONAL WORKSHOP, April 2019

Nichia Corporation, Hiroaki Kuroda

日亚化学工业株式会社 黑田浩章



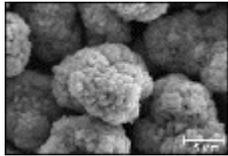
Our contribution for Automotive Industry

日亚化学工业在车载领域的成就

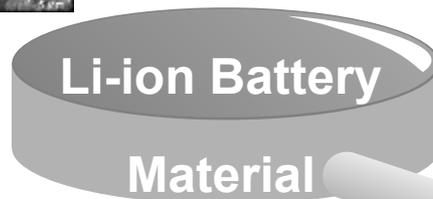
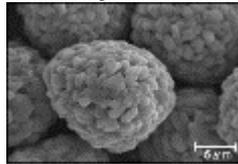
3 Mottos

- ✓ Technical Innovator 致力于技术创新
- ✓ Stable & Direct Supply 直接且稳定供货
- ✓ Focus Material and Component 专于材料与零部件

LiMn2O4



LiNixCoyMnzO2



Sm2Fe17N3

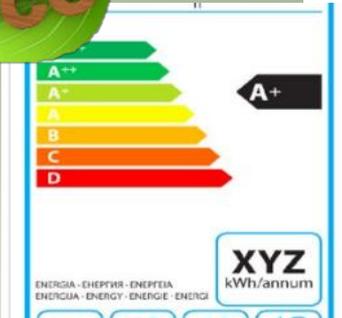


日亚化学工业

ECO Environment around us 环保



2019 - 2021
Country Regulation



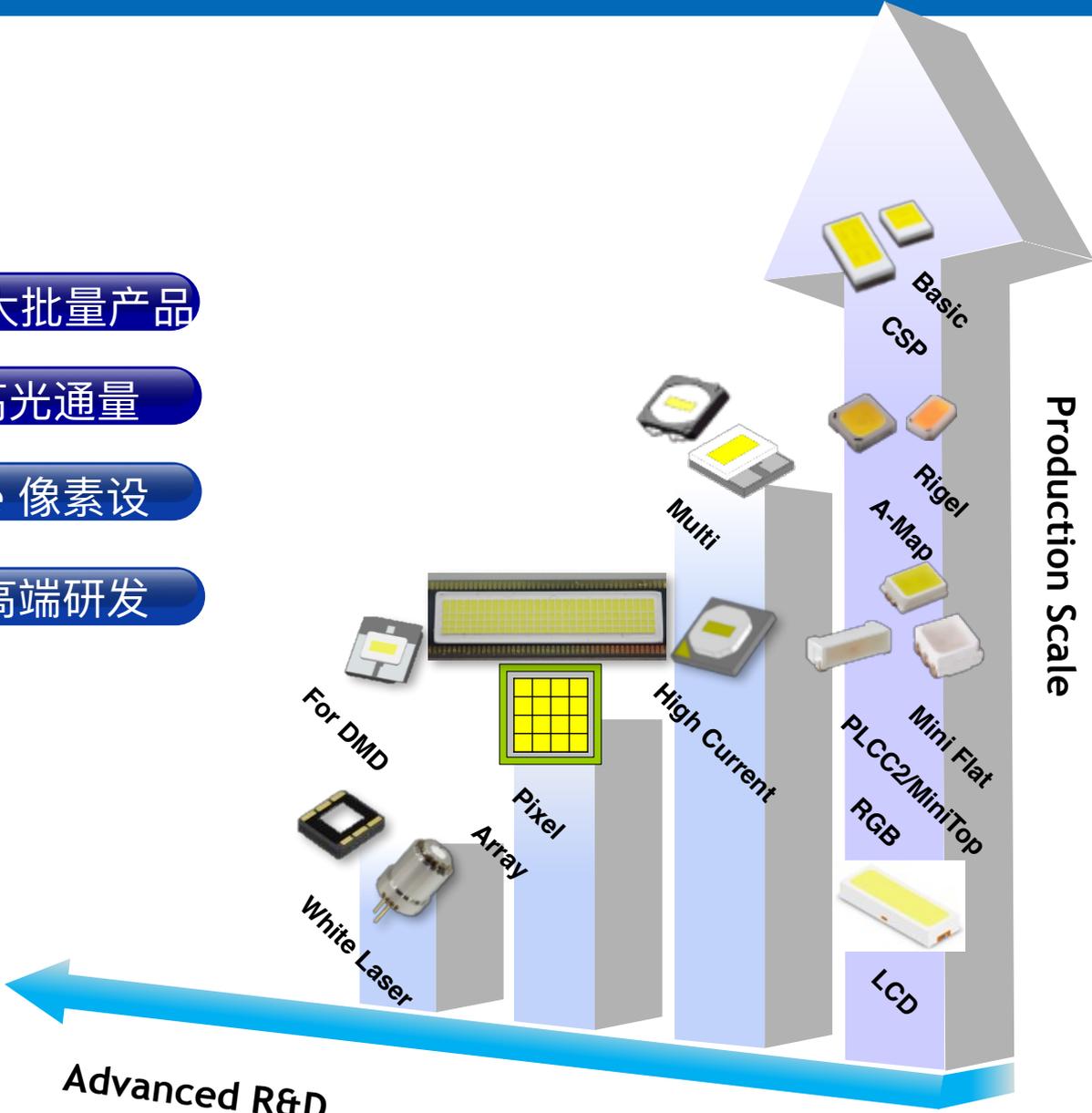
Post 2020
CO2 Reduction



Electronic Vehicle - EV
Autonomous Vehicle - AV

R&D Segments 研发细分

- High Volume 大批量产品
- High Flux 高光通量
- Pixel Device 像素设
- Advanced 高端研发



Elements for Vehicle identity 车辆识别要素

Design Identification 设计鉴定



Technology Identification 技术鉴定

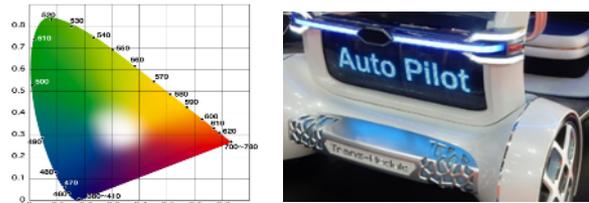
Brightness

Contrast

Pixelization

High Luminance

Color Identification 色度鉴定



Design 设计

Reflector 反射板



Bi-Beam 双灯



Advanced Design 高端设计



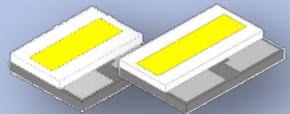
CSP 晶片尺寸的LED



✓ Main stream of CSP and CSP multichip

Direct Mount

直接焊在基板上



✓ Upper Electrode

Multi SMD

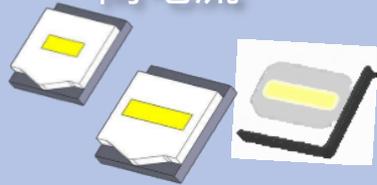
多颗SMD



✓ Heat spreader SMD type

High Current

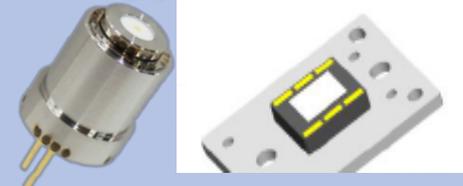
高电流



✓ High Luminance and contrast

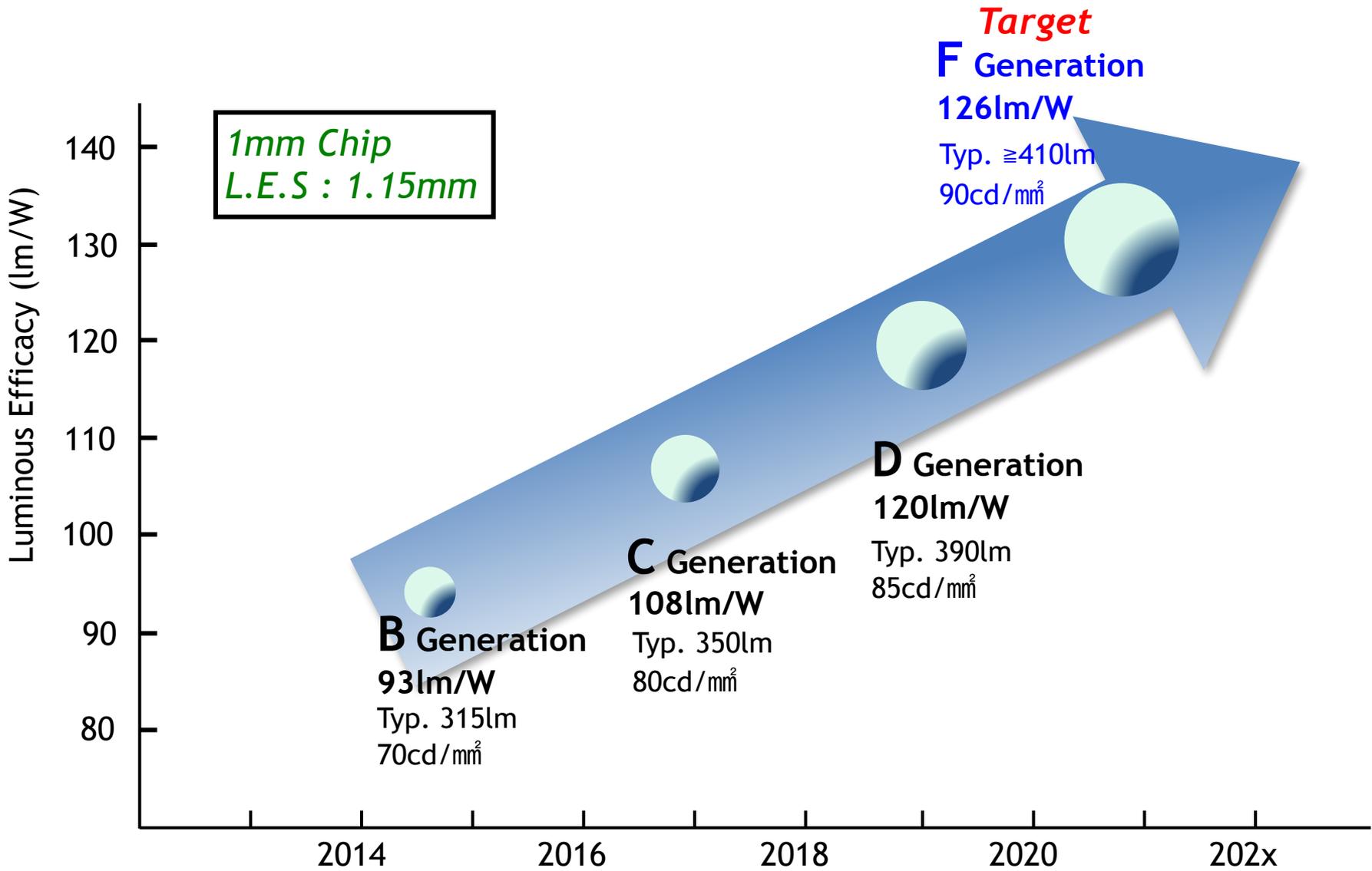
White Laser

白色激光

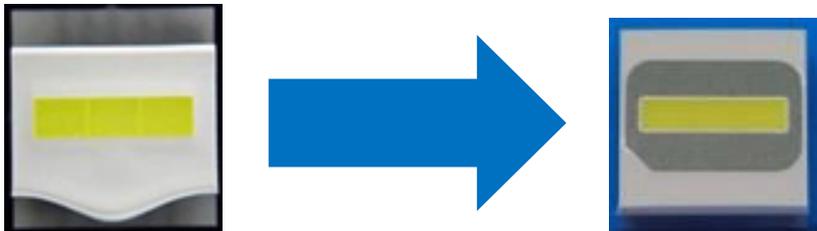


✓ LASER High Luminance

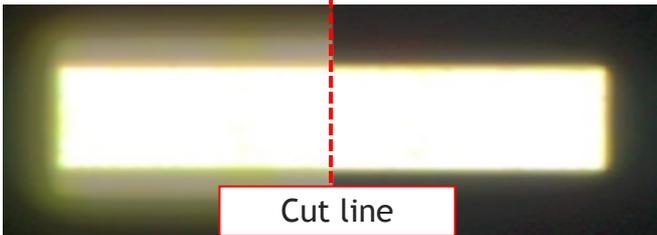
Brightness 亮度



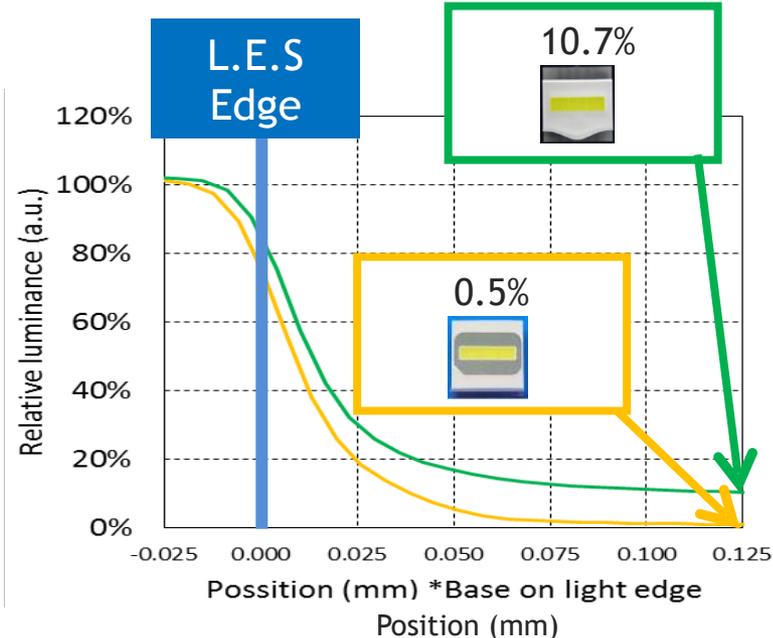
Contrast 对比



Comparison of light emission 发光比较



Light distribution simulation 光分布模拟

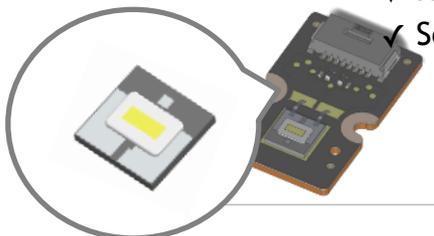


Pixelization 像素化

High Pixel Range 高像素

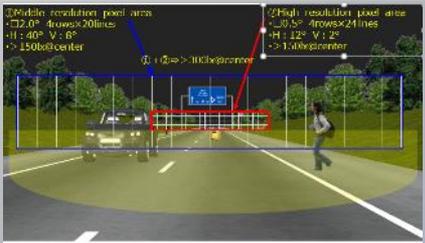


DMD LED

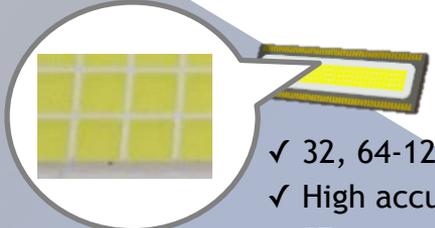


- ✓ Less Optical and System Size 光学和系统尺寸更小
- ✓ High current driving 高电流驱动
- ✓ Semi-Module proposal 半模组

Middle Pixel Range 中像素

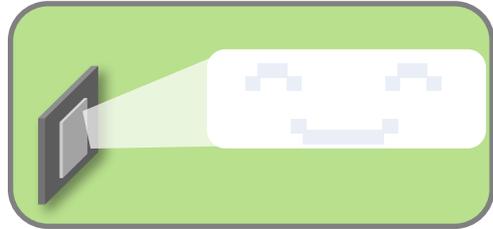


COB Array



- ✓ 32, 64-128 pixels 像素
- ✓ High accuracy pitch 高精度间距

1K Pixel

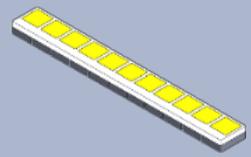


- ✓ Over 1K pixels range 1k像素
- ✓ Build-in IC Driver 内置驱动

Low Pixel Range 低像素

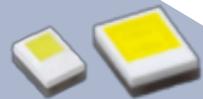


Simple Strip



- ✓ 1-3 rows 1-3列

CSP



- ✓ Simple ADB system 简易ADB系统
- ✓ Simple Optics 简易光学系统

- ✓ Standard CSP, Mini CSP, Multi CSP 标准CSP、迷你CSP、多CSP
- ✓ 10-100 pixels range 10-100像素

Volume Zone

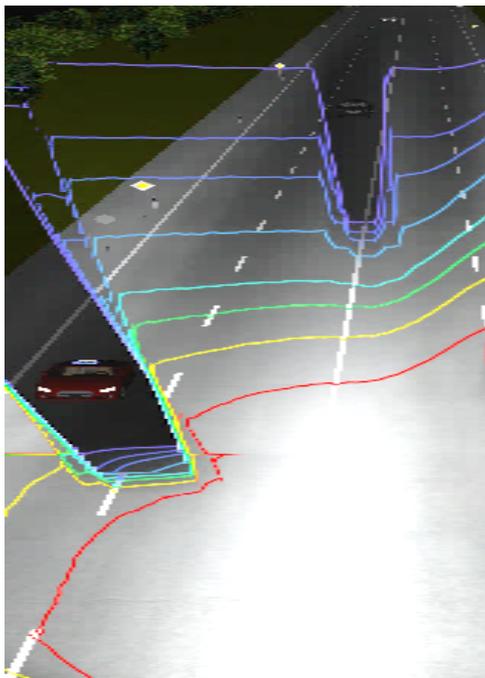
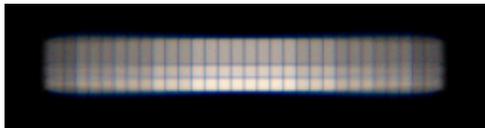
Pixelization Study 模拟

Optical Simulation for ADB Headlight 光学模拟

- moving simulation

通过移动试验来模拟

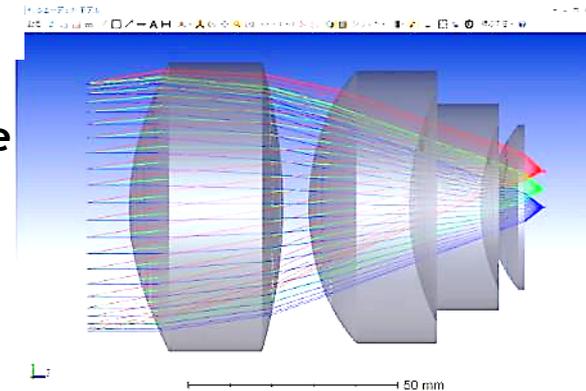
150pixel 150像素



- Directivity and illuminance

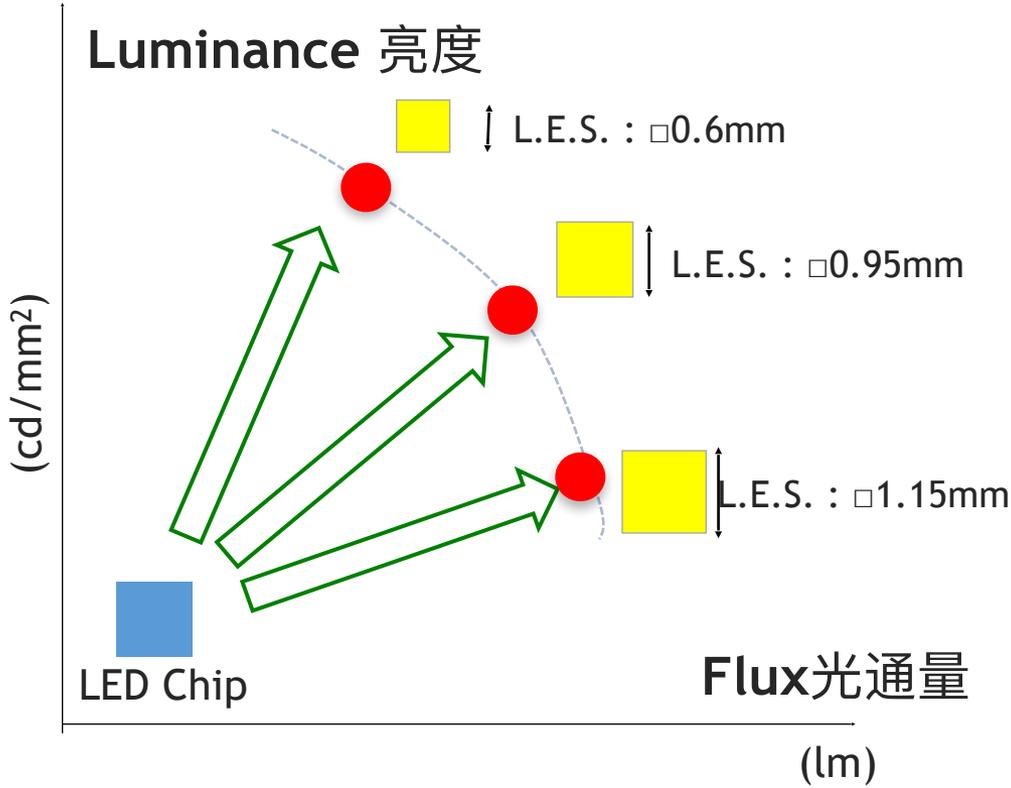
评估方向性和照度

1Kpixel 大于1000像素



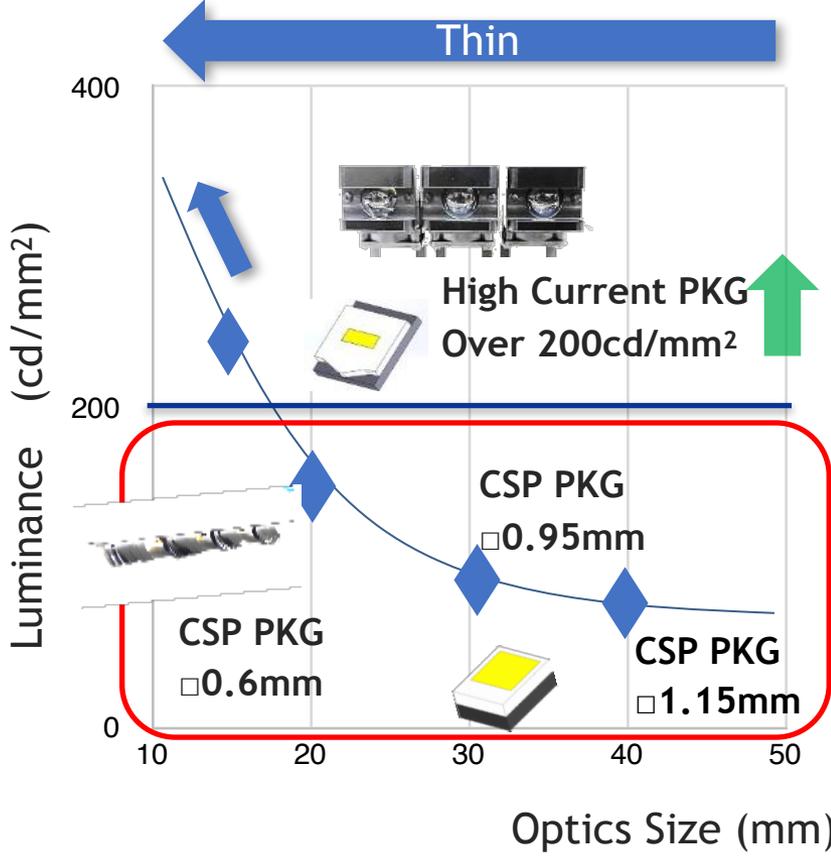
Luminance 亮度

Flux vs. Luminance 光通量与亮度



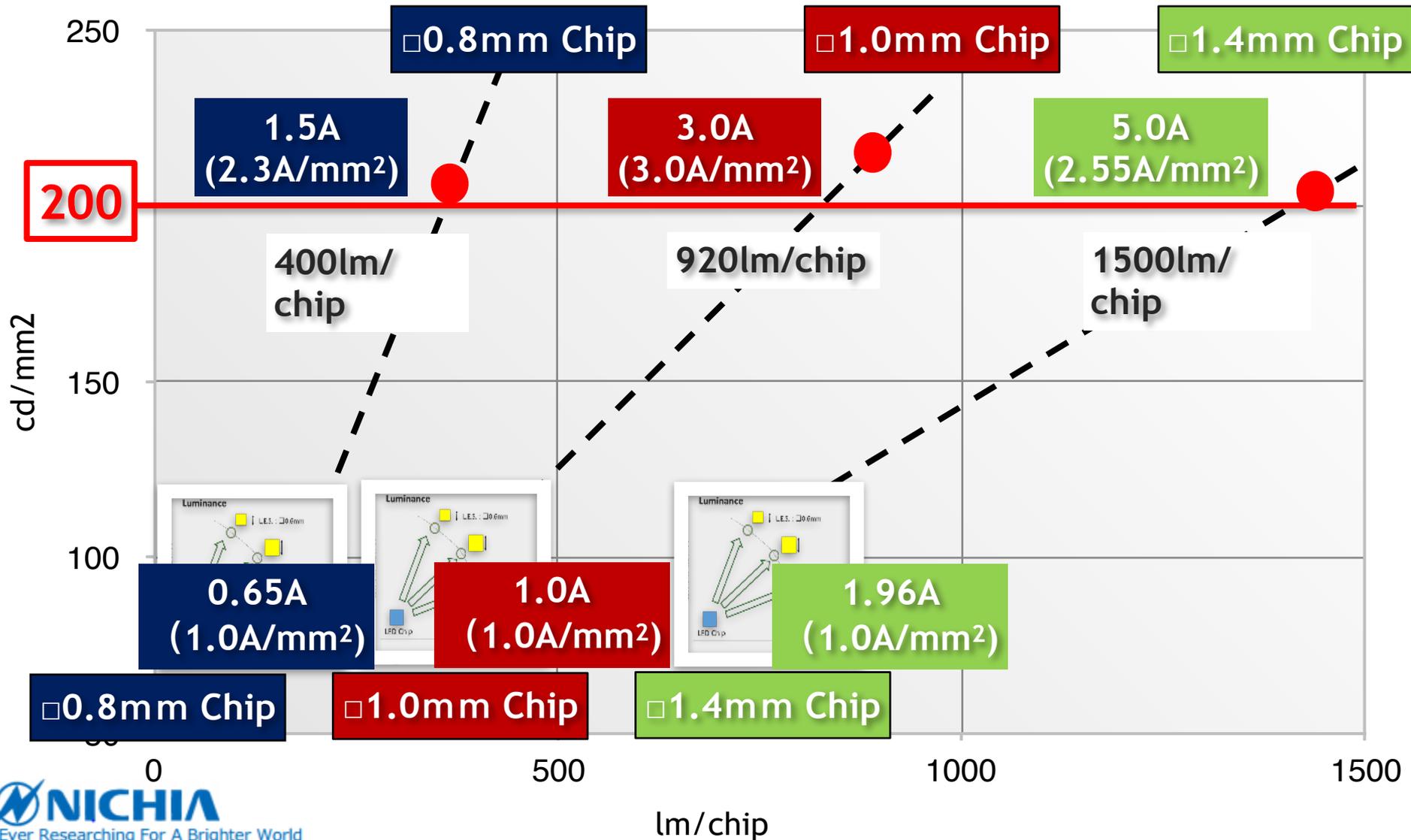
- L.E.S type
- High flux L.E.S. (width) : 1.15mm
 - Balanced L.E.S. (width) : 0.95mm
 - High Luminance L.E.S. (width) : 0.6mm

Optics Size vs. Luminance 光学尺寸与亮度



Luminance Study (Chip Size & Current Density)

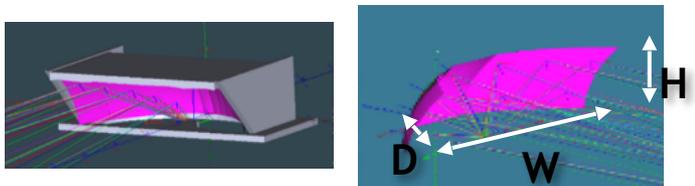
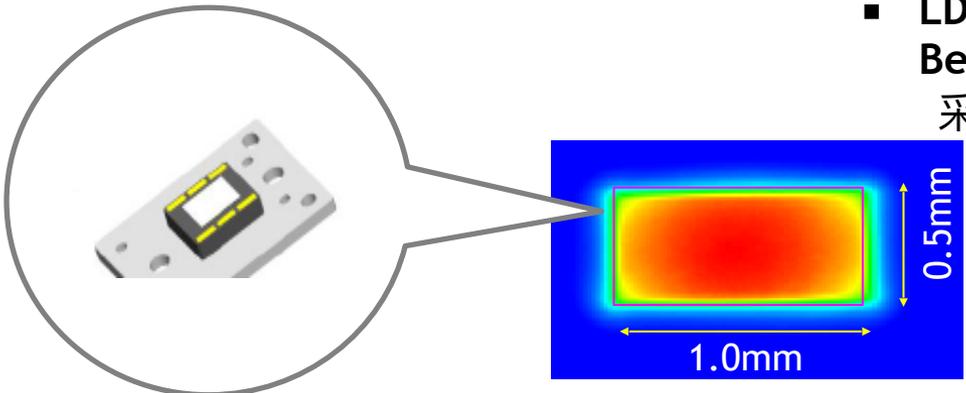
亮度研究(芯片尺寸和电流密度)



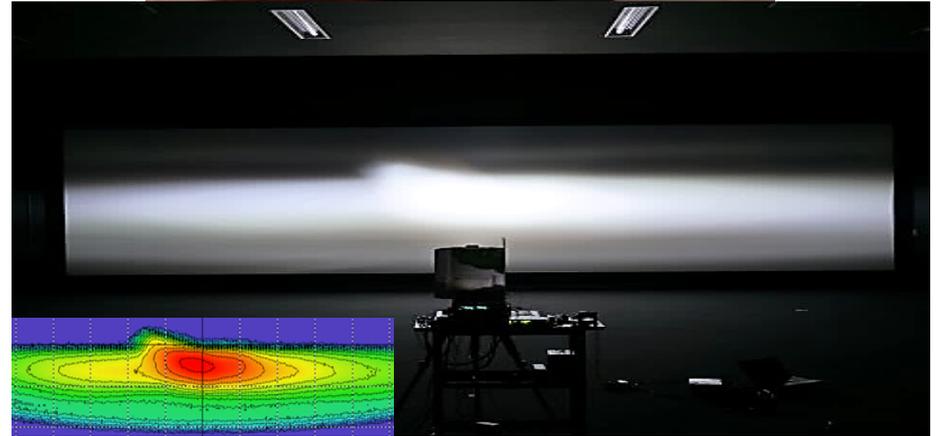
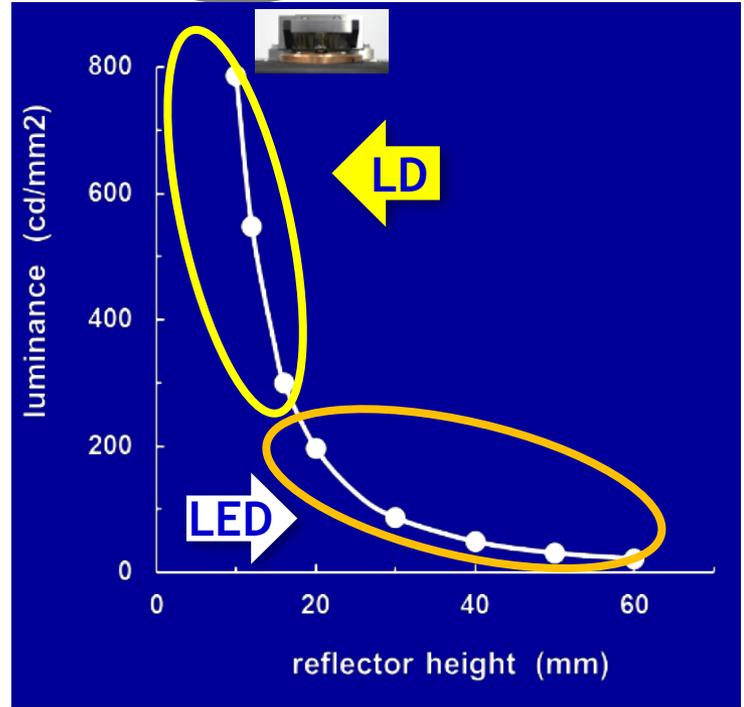
LASER Luminance

- LD with Ultra Narrow Reflector for Low Beam

采用超窄边反射器的LD，适用于近光。



Reflector : W 32 x D 20 x H **8.5** mm



White LASER - GigaWhite - 超白激光

- ✓For Additional Beam 用于辅助灯
- ✓Single chip 单晶
- ✓Pin connection(TO-9) 引脚连接

- ✓For Additional Beam 用于辅助灯
- ✓Same design as Gen1 设计与1代(Gen1)相同
- ✓New LD dice 新LD晶片

- ✓For Lo/Hi Beam 近/远光皆可
- ✓Multi dice 多晶片
- ✓SMD
- ✓Eye-Safety sensor 护眼传感器

Luminous Flux 光通量

1000lm

500lm

Gen1

Gen1.5

Gen2

Peak 330cd/mm2
(Ave.230cd/mm2)

530lm
Peak 420cd/mm2
(Ave.300cd/mm2)

[Target]
>>1000lm
Peak>>600cd/mm2

2017

2019

2021

● Available

● Under Development

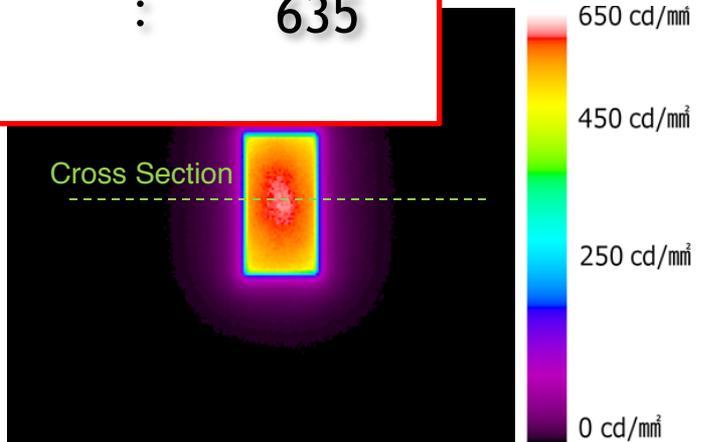
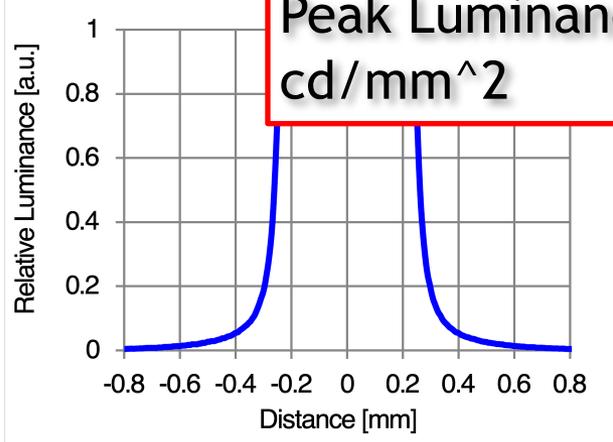
GigaWhite GEN.2

二代超白激光

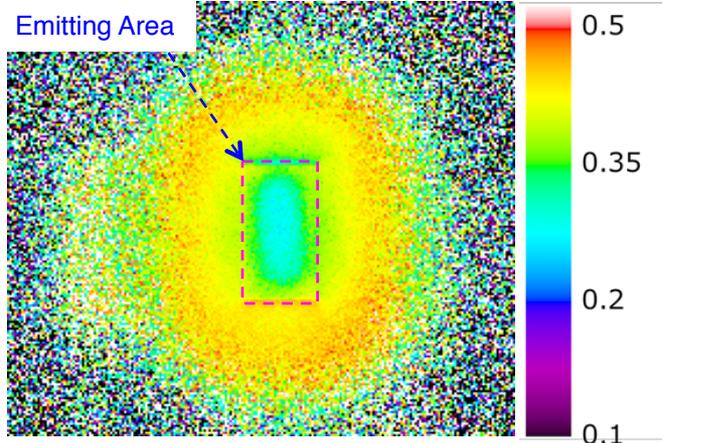
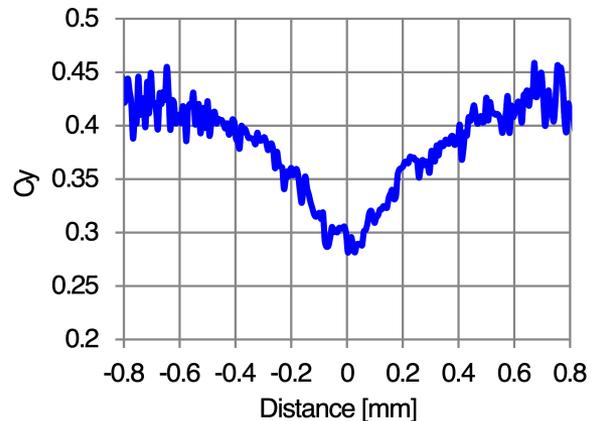
Sample: mock up sample
Measurement Condition: 2.3A
(8.3V)

Luminous Flux : 1162 lm
Average Luminance: 572 cd/mm²
Peak Luminance : 635 cd/mm²

Luminance



Color Coordinate



- **Researching for the technology of LED, LD and Material.**
寻求LED、激光和未来新型材料的新技术。
- **Advanced, more precise and reliable production.**
追求更高品质，更精确和可靠的产品。
- **R&D communication with customers/OEMs.**
研发中与客户/OEM充分沟通。
- **Bring our wider capability to your vehicle.**
为汽车标准化做贡献。

谢谢聆听！

